AN INTERNATIONAL MEETING DISCUSSES THE ROLE OF SUPERCOMPUTING IN NUCLEAR APPLICATIONS

The role and benefits of high-performance computing in complex simulations carried out by researchers, industry and universities in the specific field of nuclear applications were the subject of expert discussions at the Fifth International Conference on Supercomputing in Nuclear Applications (SNA-2003), held in Paris on 22-24 September 2003.

This international conference, organised by the French Atomic Energy Commission (CEA), the OECD Nuclear Energy Agency (OECD/NEA), and the French Section of the American Nuclear Society (SFANS), gathered some 260 participants from 25 countries. Co-sponsors of this event were: AREVA, ANDRA, EDF and SFEN; the American Nuclear Society (ANS), the Atomic Energy Society of Japan (AESJ), the European Commission (EC), the European Nuclear Society (ENS), the Korean Nuclear Society (KNS) and the Radiation Safety Information Computational Center (RSICC).

Opening the conference, the French High Commissioner for Nuclear Energy, Mr. Bernard Bigot, the Director-General of the OECD/NEA, Mr. Luis Echávarri, and Dr. Larry Foulke, President of the American Nuclear Society, stressed the importance of high-performance computing for improved simulation at different levels of complex systems such as nuclear power plants.

The 140 scientific and technical papers presented offered a broad overview and perspectives of how computers and computing will develop and the impact this may have in areas such as research for nuclear science and engineering, nuclear safety, and simulation ranging from the microscopic level across many dimension scales to macroscopic system effects, and on co-operation between industry and universities.

A major conclusion of the conference was that increased performance of computers and gains in efficiency and speed through improved computational methods is needed for refined modelling, system optimisation, and integration of different models for full system simulation. However, continuously increasing computer speed is insufficient to solve a number of problems in science and technology, including those related to nuclear energy applications. To be able to solve those problems, further development of algorithms and numerical methods that are well adapted to the architecture of new emerging computers are needed.

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The methodologies presented at the conference are expected to contribute to the development of improved materials and other products that help enhance the safety of modern nuclear power reactors.


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